Physics Honors Final Exam Study Guide

Unit 1 - 1D Kinematics (7)

- Scalar and Vector Quantities
- Position, Distance, and Displacement
- Velocity-Time Graphs
- Constant Acceleration Equations
- Free-Fall and Objects Falling From Rest

Unit 2 - 2D Kinematics (5)

- Half-Projectile Motion
- Full-Projectile Motion
- Vector Components

Unit 3 - Dynamics (8)

- Newton's 1st Law of Motion
- Free Body Diagrams
- Newton's 2nd Law of Motion
- Net Force Equaling Zero
- Establishing Static Equilibrium
- Net Force and Acceleration
- Frictional Forces
- Newton's 3rd Law of Motion

Unit 4 - Circular Motion and Gravity (5)

- Centripetal Force
- Vector Direction of Centripetal Motion
- Newton's Universal Law of Gravitation
- Force of Gravity or Weight
- Vector Direction of Gravitation

Unit 5 - Work, Energy, and Power (8)

- Work
- Force vs. Displacement Graphs
- Conservation of Mechanical Energy
- Gravitational Potential Energy
- Kinetic Energy
- Work-Energy Theorem

Unit 6 - Momentum (4)

- Impulse-Momentum Theorem
- Conservation of Momentum
- Explosion Momentum
- Inelastic Collisions

Unit 7 - Electrostatics (6)

- Coulomb's Law
- Vector Direction of Electric Charges
- Charging by Induction
- Newton's Third Law of Electric Force
- Electric Field Lines
- Vector Direction of Charge Deflection

Unit 8 - Circuits (7)

- Electric Current
- Ohm's Law
- Series Circuits
- Parallel Circuits
- Voltmeters and Ammeters

Unit 9 - Magnetism (4)

- Magnetic Field
- Vector Direction of Magnetic Fields
- Production of Magnetic Fields
- Production of Electric Potential

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Unit 10 - Waves and Sound (6)

- Wave Characteristics
- The Wave Equation with Sound
- Resonance
- Interference
- Doppler Effect
- Properties of Sound Waves

Unit 11 - Light (6)

- Diffraction
- The Wave Equation with Light
- Properties of Light Waves
- Reflection
- Refraction and Snell's Law

Unit 12 - Modern Physics (9)

- Wave-Particle Duality
- Energy Calculations of Photons
- Electromagnetic Spectrum
- Energy Level Diagrams
- The Standard Model
- Mass-Energy Equivalence